

Notice of Allowability

Application No.

10/725,336

Applicant(s)

LEV ET AL.

Examiner

Raj K. Jain

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/2/03.
2. ☒ The allowed claim(s) is/are 1,3-7,9-14 renumbered 1-12.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 20070801
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 20070801
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr Ed Langer on 7/23/07.

Cancel claims 2, 8 and 15.

Amend claims 1, 3-6 and 9 and abstract as follows:

1. (Currently Amended) A multimedia packet re-multiplexer system having a plurality of multimedia sources, each multimedia source sending incoming multimedia packets, each packet having a header which includes a packet identifier (PID) to determine the packet type, said system comprising:

- an interface multiplexer (mux) for periodically scanning the multimedia sources for the incoming packets;
- a main storage device for storing each incoming packet;
- a secondary storage device having a cut-through mechanism for storing the header of each incoming packet;
- an input classifier for selecting a process for each packet stored in said main storage device, in accordance with the corresponding header from said secondary storage device;
- a plurality of processors, each corresponding to a packet type; and

an input dispatcher for sending each packet from said main storage device to one of said plurality of processors selected in accordance with availability,
such that said cut-through mechanism provides efficient digital video processing via said plurality of processors, enabling gigabit bandwidth throughput for digital video re-multiplexing,

wherein the packet types are among the following:

video;

audio;

data; and

stuffing (filler).

and wherein said system further comprises a homogeneous null stuffing module adapted to provide for transmission of constant bit-rate (CBR) streams, said homogeneous null stuffing module comprising:

a high priority first-in/first-out (FIFO) buffer filled with packets coming from a packet router;

a low priority FIFO buffer continuously filled with null packets to a pre-defined level; and

an arbiter continuously scanning said high priority FIFO buffer and said low priority FIFO buffer, according to the following procedure:

scanning said high priority FIFO buffer until it is empty;

taking a null packet from said low priority FIFO buffer; and

returning to scan the high priority FIFO buffer.

3. (Currently Amended) The system of claim 2 1, further comprising:

a plurality of output ports capable of transmitting the packetized video;

an output classifier, deciding for each packet, to which of said plurality of output ports to route said packet; and

an output dispatcher, sending packets stored in said main memory to said output port.

4. (Currently Amended) The system of claim 2 1, wherein said multimedia packets are in Digital Video Broadcasting Asynchronous Serial Interface (DVB/ASI) format and are framed to Packet Over Sonet (POS) format.

5. (Currently Amended) The system in claim 02 1, wherein said multimedia packets are in DVB/ASI format and are framed to Gigabit Media Independent Interface (GMII) format.

6. (Currently Amended) The system in claim 2 1, wherein said multimedia packets are in DVB/ASI format and are framed to Serial Media Independent Interface (SMII) format.

9. (Currently Amended) A method for re-multiplexing a plurality of multimedia packets, each packet having a header, the header having a packet identifier (PID) field used to determine the packet type, the method comprising:

periodically scanning for full incoming packets;

storing said full incoming packets in a main memory device;

using a cut-through mechanism for storing the header of each incoming packet in a secondary memory device;

examining the header, wherein said examining activity further comprises:

classifying each video packet type in a classification according to its PID; and

identifying the required process according to said classification;

selecting, according to availability, among a plurality of processors, which
of said processors is to handle each said classified packet; and
processing the packets stored in said main memory device in said
selected processor;

such that said cut-through mechanism provides efficient digital video
processing via said plurality of processors, enabling gigabit bandwidth
throughput for digital video re-multiplexing,

wherein the method further comprises adapting a homogeneous null
stuffing module to provide for transmission of constant bit-rate (CBR) streams,
wherein said adapting activity further comprises:

filling a high priority FIFO buffer with packets coming from a packet router;
continuously filling a low priority FIFO buffer with null packets to a pre-
defined level; and

continuously scanning, via an arbiter, said high priority FIFO buffer and
said low priority FIFO buffer, according to the following procedure:

scanning said high priority FIFO buffer until it is empty;
taking a null packet from said low priority FIFO buffer; and
returning to scan the high priority FIFO buffer.

ABSTRACT OF THE DISCLOSURE

A multimedia packet re-multiplexer system having a plurality of multimedia
sources, each multimedia source sending incoming multimedia packets, each packet

having a header which includes a packet identifier (PID) to determine the packet type. The system includes an interface multiplexer (mux) for periodically scanning the multimedia sources for the incoming packets. The system also includes a main storage device for storing each incoming packet, a secondary storage device having a cut-through mechanism for storing the header of each incoming packet, an input classifier for selecting a process for each packet stored in the main storage device, in accordance with the corresponding header from the secondary storage device. ~~In addition the system includes a plurality of processors, each~~ Each ~~corresponding to a packet type and an input dispatcher for sending each packet is dispatched~~ from the main storage device to one of the a plurality of processors selected in accordance with availability, such that the cut-through mechanism provides efficient digital video processing via the plurality of processors, enabling gigabit bandwidth throughput for digital video re-multiplexing.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims 1 and 9, are allowed.

The prior art discloses a re-multiplexer system having a plurality of multimedia sources, each multimedia source sending incoming multimedia packets, each packet having a header which includes a packet identifier (PID) to determine the packet type.

The prior art however fails to disclose wherein said system further comprises a homogeneous null stuffing module adapted to provide for transmission of constant bit-rate (CBR) streams, said homogeneous null stuffing module comprising: a high priority first-in/first-out (FIFO) buffer filled with packets coming from a packet router; a low priority FIFO buffer continuously filled with null packets to a pre-defined level; and an arbiter continuously scanning said high priority FIFO buffer and said low priority FIFO buffer, according to the following procedure: scanning said high priority FIFO buffer until it is empty; taking a null packet from said low priority FIFO buffer; and returning to scan the high priority FIFO buffer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raj K. Jain whose telephone number is 571-272-3145. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raj K. Jain

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